GEO-FOUNDATIONS
Contractors Inc.

Geo-Connect

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FEATURE STORY

NWMO Deep Geologic Repository – Deep Grouting Trial

At Bruce Nuclear Generating Station near Tiverton, Ontario the construction of a deep geologic repository (DGR) is being considered by Nuclear Waste Management Organization (NWMO) for the long term storage of low and medium level radioactive waste. As part of the feasibility study for the DGR, Geo-Foundations has been busy since June working day and night performing drilling and grouting of 200-metre deep holes for a deep grouting trial being executed to determine the ability to pre-treat the rock formation prior to excavation of the proposed DGR shafts. Pre-grouting of the rock is necessary to permit excavation under controlled inflow conditions; the grouting trial is being executed to test and establish drilling and grouting methods specific to this site. With the consultant having placed considerable importance on the drilling accuracy at depth (with a specified tolerance of 0.5 degrees, or +/- 1.0 metre in plan at 200 metres depth), the drilling method ultimately chosen was the *Wassara* water hammer system for its ability to drill straight, clean holes with reasonable speed. Gyro survey methods have been used to periodically check hole alignment and determine when corrections are required, at which point the *Navi-Drill* system is being utilized to make minor hole alignment corrections to maintain the required tolerance. The test program has thus far consisted of 3 primary holes and one secondary/verification hole each being drilled, water tested and grouted. Prior to grouting an acoustic televiewer is being used to supplement the water test data in order to better establish the nature of the rock fractures. The test program is due to continue into October of 2011.

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Geo-Foundations Nears Completion of Innovative Excavation Support Installation Underneath Toronto's Historic Union Station

In May 2010 Construction Managers Carillion Canada awarded a multi-million dollar design-build contract to Geo-Foundations for supply and installation of excavation support, micropiles, and permanent tieback anchors as part of the ambitious Union Station Revitalization Project.

This historic landmark covers a full city block in downtown Toronto and is one of the busiest commuter rail terminals in North America. The station has a Heritage Designation from Parks Canada and remained fully operational throughout all of Geo-Foundations' work. The project's multiple stakeholders include The City of Toronto, CN Rail, GO Transit, VIA Rail and TTC.

Geo-Foundations developed an innovative micropile / tieback / shotcrete support scheme to retain the south wall of the viaduct structure while excavation up to 6 metres below existing basement levels was carried out to enable construction of a new, below-grade retail concourse. This work was completed entirely indoors within limited headroom and subject to strict concrete truck delivery restrictions.

Geo-Foundations' work on Phase 1a is now nearing completion with Phase 1c scheduled to start in 2013.

Geo-Foundations' 10th Anniversary Family BBQ

On August 6th, employees and their families and a handful of special guests gathered in Rockwood, ON, for a celebration of Geo-Foundations' 10th Anniversary. Despite the rain that set in precisely at supper time, the 80 attendees enjoyed a fun-filled day of children's face painting, swimming in a spring-fed pond and dunking of senior personnel in the charity dunk tank fundraiser. A gourmet barbeque feast was served and a live band sang into the night (under the tent, out of the rain). A memorable day was had by all.

Todd Edmunds, President of Geo-Foundations (right) accepts a commemorative gift from the employees of Geo-Foundations, presented by Jim Bruce

BY THE NUMB3RS

"Multi-strand Rock Anchors"

The majority of Geo-Foundations' past rock anchor projects have featured rock anchors with multi-strand tendons. There are 7 wires in a single strand, and the steel is appreciably stronger (at **1855 MPa** ultimate stress) than solid bar post-tensioning steel (at 1030 MPa ultimate stress).

The largest single rock anchor ever installed by Geo-Foundations had a tendon consisting of **48** strands, for an ultimate strength of **12528 kN**.

The largest number of individual strands installed by Geo-Foundations on any one project was **2884** strands (on 412 rock anchors) at Boundary Dam in Saskatchewan.

Geo-Foundations on the Road

Geo-Foundations engineering staff will be busy this October at industry conferences on both sides of the border. Geo-Foundations is sending a 3-member contingent to the Deep Foundations Institute's 36th Annual Conference in Boston, MA, taking place between October 17th and 21st. Closer to home, Geo-Foundations has signed on as an Exhibitor at two technical conferences in Canada: we will be present at the Canadian Geotechnical Society's Pan Am Conference in Toronto from October 3rd to 6th and at the Canadian Dam Association's Annual Conference in Fredericton, New Brunswick from October 15th to 20th. Come visit our booth in Toronto and Fredericton!

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